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What motivates public support for public transit?

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ABSTRACT

Voters often support increased spending for public transportation, but the motivation behind this support is as hard to discern as it is substantively important. Why do voters support transit? We use a survey-framing experiment (n = 1200) to evaluate the persuasive effects of common arguments for public transit. We study how different arguments change not just people's attitudes toward transit, but also their willingness to become politically active on its behalf. Our findings are twofold. First, arguments that transit will reduce congestion or improve environmental outcomes (specifically, mitigate climate change) make people more supportive of public transportation, while arguments about making travel more convenient, helping the poor, or satisfying other people's desire for transit do not. Second, congestion-based arguments are self-undermining with respect to activism: they make people more likely to support transit, but *less* likely to become activists for it. Congestion-based arguments are persuasive because they remind people of wasted time, but in reminding people of time-scarcity they reduce people's willingness to become involved. Overall, our results suggest that the common reasons people use transit are not powerful political arguments for supporting it, and that one powerful political argument for supporting it, in addition to being inaccurate, might undermine efforts to organize on its behalf.

What makes voters support public transit? In the United States, public transportation is popular at the ballot box. Advocates, elected officials and everyday citizens often argue that better transit can offer safe and efficient travel, improve quality of life, and reduce traffic congestion and air pollution (e.g., APTA, 2016). At least some of these messages seem to resonate with voters. In November 2016, state and local voters cast ballots on hundreds of different "local option" transportation taxes: proposals to raise their own taxes to help fund transportation improvements. Many of these measures included substantial funding for transit, and about 50 of them, collectively representing over $200 billion in transit investment, were primarily for transit (APTA, 2016). The agencies and advocates who supported these proposals spent tens of millions of dollars promoting them, and over 70 percent of these measures, representing over $200 billion in investment, were approved (Eno Center for Transportation, 2016). Nor was 2016 unique: since 2000, hundreds of localities have approved local tax increases to finance billions of dollars in transportation service, and many of these increases have been oriented largely around transit. The success rate of these referenda in most years approaches 70 percent (Center for Transportation Excellence, nd).

This success is notable, and not just because votes to increase taxes are unusual.[1] Most voters, even in places where these ballots succeed, do not *use* public transportation, which raises the question of why they support it (Manville and Cummins, 2015). Transit use in the US is rare, and concentrated in both a small share of people and small number of places. Transit accounts for about 2 percent of all annual trips and 2 percent of all miles travelled, and only 8 percent of Americans ride transit more than ten times per month. Over 40 percent of all American transit trips occur in metropolitan New York. Outside New York, transit riders tend to be low-income. The median household income of a transit rider in Los Angeles, for example, which has approved four transit-oriented tax measures, is about $17,000. Transit's political base thus seems much larger than its customer base.

Given transit's low level of use, how should we interpret its strong political support? What makes transit popular to finance? This

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[1] The success rate is at least partly endogenous, since transit elections are initiated by their proponents, and the proponents are unlikely to bring proposals forward if they don't think success is likely.

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article examines the relative power of different arguments for public transportation, to help discern the motivation behind its electoral success. We examine arguments suggesting that transit will reduce congestion, that it will help the environment, that it will let people drive less, that more people want transit, and that transit will help the poor.

Understanding the popularity of transit finance has obvious fiscal implications for transportation policy, given the billions of dollars at stake each year. But the source of transit's political support might also hold clues about its longer-range prospects, and hint at whether agencies can convert the revenue they raise into strong systems with strong ridership. Finance is a necessary but not sufficient condition for transit's success. Even with ample revenue, creating a high-quality transit system requires negotiation (and often conflict) over the routes transit vehicles will operate, whether the transit vehicles will have priority over automobiles, and whether the areas around stations and stops will allow higher density development. These implementation debates are often hard-fought, and cannot be resolved with tax dollars; they require political commitment and political capital. Building a successful transit system might thus require at least some transit voters to become transit activists (and, of course, transit riders).[2]

Simply knowing that people voted "yes" on a transit ballot cannot tell us if they will become active on transit's behalf. Voting is both a low-cost and low-information form of political expression, and it is therefore a weak indicator of preference intensity. Voting on a transit referendum takes little effort, especially for people already in the voting booth for another reason (for instance, to vote for President), and people who strongly support more transit cast the exact same vote as people who just barely favor it. Votes also convey almost no information about motives. While a "yes" vote on a transit ballot tells us a voter supports transit funding, it says nothing about why. But both the intensity of the preference and the motivation behind it matter, especially when battles over implementation arise. People who vote to increase transit funding because they strongly want to *use* transit might turn out to a meeting to support giving express buses their own lanes. People who expressed a weaker preference may not. Or consider people who strongly supported transit spending because they thought it would reduce congestion and let them keep driving: if these voters see bus-only lanes as worsening congestion for drivers, they will also not turn out to support implementation.

To help determine why voters support transit finance, we conducted a survey experiment survey in Los Angeles County in November 2016, immediately before voters decided on Measure M, the largest transportation ballot initiative in modern US history. Our survey simultaneously examined two dimensions of issue engagement: attitudes and participation. We investigate not only which arguments make people support public transportation, but also which arguments motivate people to become involved in transit advocacy.

We study five common arguments for increased transit investment: fighting congestion, providing more travel options, helping the poor, mitigating climate change, and responding to consumer demand (i.e., because more people want it, we should build more of it). We pay particular attention to the congestion argument. Congestion relief is probably the most common argument for more transit investment, probably the hardest goal for transit to accomplish, and—most important—congestion-based arguments for transit have the potential to be self-undermining. By that we mean that there is reason to think that congestion-based arguments for transit investment will make citizens more likely to support transit ballots, but also *less* likely to become involved on transit's behalf. Involvement requires time, and arguments based on congestion remind people that they don't have the time to do things they would like, because they spend so much time sitting in traffic.

1. Public transit, political persuasion, and political action

Our study draws on the relatively small research literature about the politics of transit and transportation policy, and on the larger and wider-ranging political science literature about issue engagement. In particular, questions about transit's political support speak to larger debates within political science about how to motivate political engagement in environments—like the contemporary US—where politics has become less personal and more professional (i.e. more dependent upon arguments that are widely disseminated). A specific contribution of our paper is to link transit politics to an emerging literature in political science about self-undermining rhetoric: the tendency of some arguments to simultaneously persuade people but make them *less* likely to act. We briefly review both these literatures in turn.

Most transit research does not examine transit's political support, but instead emphasizes the determinants of its ridership, its transportation and land use outcomes—e.g., on congestion, job access, or land values—and the appropriateness of its subsidies (Taylor et al., 2009; Parry and Small, 2009; Duranton and Turner, 2011).

Many observers, however, understand that transit faces a difficult political problem, which is a mismatch between its customers and its funders. Transit riders are disproportionately low-income, making transit an important social service—a mobility safety net for people who cannot drive. This social service role makes raising fares difficult, and as a result transit systems rely heavily on subsidies from the electorate at large, which is composed mostly of non-riders (Taylor and Morris, 2015). In these circumstances, and especially when funding hinges on direct votes via referendum, transit advocates must justify public transportation to people who don't use it.

This problem is not unique to transit, and in the past, policy entrepreneurs overcame it by using established political networks. For much of the postwar period, political information (both substantive information about issues, and opportunities for activism) spread through in-person social connection (Putnam, 2000, Schier, 2000, Skocpol, 2003). Labor unions, political parties, and clubs and civic groups gave people regular face-to-face opportunities to discuss politics, articulate shared interests, and mobilize. As a

[2] Two examples, both from Los Angeles: Cavanaugh (2016) discusses a controversy over whether a voter-approved light rail line will have signal preemption authority, and Scauzillo (2018) reviews a conflict over the routing of a voter-approved subway expansion.

result, electoral persuasion and public activism were driven as much by social relationships as by whether people found issues personally relevant (Wilson, 1973). Over the last several decades, however, the membership and clout of these groups has dwindled (Skocpol, 2003), and political organizations today are more likely to raise awareness and recruit activists using mass messages that seek to make issues personally relevant.

Transit, from one perspective, would not be expected to fare well in this new political environment. Few people use transit, so advocates might have difficulty making it personally relevant. Yet the success of transit referenda suggests that, at least when it comes to voting behavior, this obstacle is being overcome. One way to make transit relevant is to emphasize its role in issues that people *do* find personally relevant. Transit advocates can make this link in two ways. First, they can build multimodal coalitions. It is rare today for a transportation ballot measure to finance *only* public transportation. Most proposals instead bundle in road and freeway improvements as well, tying benefits for drivers into the same political package as benefits for transit riders (Luberoff, 2016; Elkind, 2014; Hannay and Wachs, 2006).[3]

The second approach is to argue that transit investments will benefit people who don't ride. Advocates often make this argument by contending that transit will reduce congestion (thus benefiting drivers) and that it will reduce pollution (improving overall quality of life) (Luberoff, 2016; Elkind, 2014; Manville and Cummins, 2015). These arguments let transit piggyback politically on issues that already enjoy high voter support. But this approach also raises two potential problems. The first problem is that salient arguments are not always accurate arguments: a political message can be both popular and wrong. Congestion, for example, is certainly salient—urban residents regularly bemoan it (Downs, 2004)—but little evidence suggests that public transportation can reduce it. Transit can help people *avoid* congestion (if they use transit instead of driving, and if the transit vehicle has its own right-of-way) but it cannot meaningfully reduce the delay faced by drivers themselves (Duranton and Turner, 2011). Anyone who doubts this contention need only think of New York City or Tokyo, where comprehensive subway systems let people move relatively quickly beneath streets jammed with cars.

The second potential problem is that arguments that increase support might not spur subsequent activism, and may in fact actually suppress it. We take up this issue next.

1.1. Persuasion and political action

Political scientists who study issue engagement define the term broadly, to encompass both attitudes and behavior (see Verba et al., 1995, Nie et al., 1996). Attitudinal engagement occurs when people express concern about an issue. Behavioral engagement occurs when people spend scarce resources (time, money, health, or social capital) to act on that concern.[4] As noted above, issue engagement of any kind is more likely when people can connect policy proposals to their daily lives—when they see public issues as personally relevant (Chong et al., 2001).

The task for advocates and policy entrepreneurs, then, is to increase the perceived personal relevance of policy proposals. This task is typically accomplished in one of two ways: by showing that the proposal will impact people's material self-interest and/or by showing that it is consistent with their underlying values. Arguments tapping into concerns about material self-interest demonstrate clear and tangible benefits (or costs) for people's lives, suggesting, for example, that a policy will save them time or money, or improve personal health (Chong et al., 2001). Arguments tapping into values, in contrast, try to align policies with the internalized predispositions that people form early in life, during the process of socialization, and that tend to persist despite changes in life circumstances (Chong et al., 2001). Examples of such values might include patriotism, loyalty to family, religiosity, fairness, or concern about the less well-off.

These two routes to personal relevance are not mutually exclusive. An argument that transit will reduce congestion mostly taps into material self-interest—"less congestion will save you time"—but an argument that transit reduces pollution could mine both personal concerns about health and more abstract beliefs about stewardship of the planet. Because they often overlap, it is not easy to draw a stark line between interests and values. For our purposes, however, it is also not necessary: what matters is that both can enhance personal relevance.

Arguments that successfully engage people on issues—however they do so—can have several consequences. First and most obviously, they shift public opinion. People are more likely to support policy proposals, more likely to prioritize them, and more likely to be informed about them, when they see them as connected to their interests and values (Citrin and Green, 1990; Boninger et al., 1995, Visser et al., 2003; Iyengar et al., 2008; Han, 2009).[5]

Second, people who are persuaded by policy arguments are more likely to become activists for that policy. Activist support is less common than attitudinal support—most people who support a policy do not become activists for it (this is the crux of the free-rider problem; Olson, 1965)—but activism is important because those who do become involved wield outsized influence in the political

[3] As an example: the first transit-finance ballot in Los Angeles, in 1968, sought to tax all of Los Angeles County to build an 11-mile subway line down Wilshire Boulevard. This measure failed by a wide margin. 2016's Measure M, in contrast, spread funding across transit, road and bicycle projects all over the county.

[4] The distinction between attitudinal and behavioral engagement lies in the difference between holding a view and acting on it. Behavioral engagement can therefore occur in multiple ways, which demand varying levels of effort. Voting, writing a letter, attending a meeting and donating money are all examples of behavioral engagement.

[5] Note that throughout this paper we focus on situations where people are exposed to arguments from others (such as the news media or other elites). It is also true, of course, that personal day-to-day experiences can inform people's political opinions and priorities.

process. While political elites are sometimes responsive to the concerns that citizens express in opinion surveys, they are much more responsive to people who express their concerns through tangible political action (Sears and Citrin, 1982; Kollman, 1998; Bartels, 2008; Baumgartner et al., 2009; Gilens, 2012; Druckman and Jacobs, 2015).

The precise relationship between activism and attitudes, however, is not straightforward. Some work finds that as people are persuaded that issues are personally relevant, the odds of their participation will rise (Visser et al., 2003). More recent evidence suggests this is not always the case. Activism can be *inversely* correlated with attitudes. Some policy arguments have *divergent* effects: they increase the likelihood of people being persuaded, but reduce the likelihood of people participating.

This result—the outcome of what is sometimes called a demotivating or self-undermining argument—occurs when arguments are convincing because they remind people of their own resource constraints (Levine, 2015, Levine and Kline, 2017, Butler and Hassell, Forthcoming). Arguments about economic insecurity, for example, might be persuasive because they tap into people's concerns about their own finances. But being reminded of those concerns might make people *less* likely to donate money to organizations trying to remedy that insecurity. This pattern can occur even among higher-income people (Levine, 2015), and importantly it arises not despite the argument being persuasive, but *because* the argument is persuasive. Analogous findings arise when people are reminded of a time-based constraint (Levine, 2015).

Demotivation clashes with traditional accounts of political engagement, which suggest that reminding people of their own constraints should not influence subsequent activism. In these accounts political action is determined largely from relatively stable personal attributes like annual income, civic skills, and free time (e.g., Rosenstone and Hansen, 1993, Verba et al., 1995). Findings about demotivation underscore how in some contexts people's subjective perceptions of their resources can diverge from their objective resources (e.g., people can *feel* poorer when they hear arguments about economic insecurity), and that it is these subjective and context-dependent feelings, not an objective accounting, which influences participation (Krupnikov and Levine, 2016).

We discuss de-motivating effects because congestion-based arguments for public transportation might be prone to them. Most people in most places do not use public transportation, but a large proportion of Americans in urban areas regularly endure traffic delays. Appeals for transit based on traffic might therefore be more persuasive than other arguments, since congestion arguments will tap into many voters' everyday experiences. The effectiveness of these arguments, however, stems from reminding people of how travel wastes their scarce time. The more effective this argument is, the more time-poor people hearing it might feel, making them simultaneously more supportive of transit and less likely to donate time to its cause. Congestion-based arguments for public transit, in short, might be *persuasive* but *paralyzing*.

2. Hypotheses

Our goal is to investigate how different arguments for public transportation influence attitudes and activism. We examine five common arguments, or frames, for public transportation. All five arguments seek to heighten the personal relevance of improved public transit by tapping into voters' interests, values, or both. We assembled these arguments by reviewing pro-transit arguments in a handful of ballot measures and from transit advocacy groups.[6] We present these arguments in more detail below, but in short they are as follows:

The *congestion frame* argues that better public transit will reduce road delays for drivers. As mentioned above, we expect this congestion frame to tap directly into people's material interests—by arguing that transit will save time—but because it reminds people about how much time they waste sitting in traffic it also reminds them that they don't have time for many other things that they may wish to do, such as engage in political participation. For these reasons, we expect the congestion frame to improve attitudes toward transit, but reduce people's willingness to become active for it.[7]

A *descriptive norm frame* argues that society should improve public transit because demand for it is rising: people generally are driving less and using transit more frequently. This frame was particularly prevalent from 2004 to 2013, when American driving declined, and when members of the Millennial generation seemed particularly averse to vehicle ownership and driving. These phenomena led some observers to argue that the US had reached "peak car", and that cities should move to accommodate these changing tastes (Lyons, 2014; McDonald, 2015; Van Wee, 2015a,b).[8]

A *convenience frame* argues that improved public transit will provide a cheap and easy way to get around, and let people avoid the hassle of driving. The *poverty frame* focuses on public transit's critical role in helping disadvantaged people, who often cannot afford private automobiles. Lastly, the *climate frame* observes that cars contribute to pollution and greenhouse gases, and that more public transit could improve environmental outcomes by encouraging people to drive less.

Unlike the congestion frame, the poverty, norm and climate arguments for public transportation are less likely to remind people of material constraints they face. They should, as a result, move attitudes and activism in the same direction. One could, of course, argue

[6] We drew, for example, on arguments made for Measures R, J and M in Los Angeles, as well as from the "Benefits of Public Transportation" fact sheets put out by the American Public Transportation Association, specifically those about congestion, the environment and energy, and growing ridership (APTA, nda, ndb, 2012).

[7] The extent to which Americans worry about congestion is open to some debate. When asked open-ended questions about the most serious problems facing their region, Americans are unlikely to list it. Yet when asked directly if congestion is a "big problem", most Americans agree that it is (Downs, 2004). Similarly, there is evidence that some Americans may think of congestion as a large social problem, but not one that influences them personally (Ory et al., 2004). In big dense urban areas, of course, congestion is likely to loom larger.

[8] The prevalence of this frame should not be confused with its accuracy. Transit use did not actually rise during this time (Manville et al., 2017), and the decline in driving has since reversed.

that some of these non-congestion frames *do* remind voters of their material constraints. We consider this possible but not plausible, at least in the context of our study. For example, the poverty frame could remind lower-income people of their material burdens, but most survey respondents, like most people, are not poor. We thus expect that for most respondents this frame will tap into abstract values about helping the disadvantaged, rather than into a sense of personal urgency around finances. Similarly, a climate/pollution frame could tap into the material concerns of people who live with high levels of air pollution, but being reminded of exposure to air pollution should not directly suggest to people that they lack the time or other resources needed to engage in activism.[9]

The non-congestion frame most likely to de-motivate is the convenience frame, which in some ways is similar to the congestion frame. Convenience also taps into material concerns about stress and time. The distinction between the congestion and convenience frames is important but subtle, and we emphasize that it may well be lost on voters. Indeed, there is some reason to think that transit advocates intentionally blur the distinction during ballot campaigns. The convenience frame is accurate but demanding: it posits that people who switch to transit can save time and stress. This can certainly be true, particularly if the transit operates on its own right of way.[10] But this benefit hinges on a behavioral change: voters must not only support new transit, but also stop driving and start riding when that transit becomes available.

The congestion frame, in contrast, asks less and promises more. This frame says that voters need only *support* transit, not switch to *riding* it, in order to benefit, because the transit will make congestion fall and thus make driving faster. Transit, in short, will help drivers who keep driving. This argument is appealing but inaccurate. As we discussed above, little evidence suggests that building transit reduces road congestion.

This distinction between the congestion and convenience frames requires careful parsing, and we recognize that people hearing the convenience argument might internalize it as something closer to the congestion argument. We have done our best, however, to reduce this risk. The convenience frame mentions the “hassle of driving”, but it never explicitly mentions congestion or any other time-based constraint. For many people, congestion probably *is* driving’s biggest hassle, and these people may make a mental leap to congestion when they read that phrase, but there also people who simply don’t enjoy driving and would rather move around some other way, regardless of traffic conditions.

In sum, the congestion frame and the convenience frame well may be near neighbors, and their similarity makes it difficult, *a priori*, to predict people’s reaction to the convenience frame. But because we wrote the convenience frame without an explicit reference to congestion or lost time, our null hypothesis is that it will not demobilize people. Table 1 summarizes our overall expectations.

3. Research design

To measure the relative persuasiveness of these different frames, and to test the idea that a congestion-based argument for public transit could be both persuasive and paralyzing, we conducted an original online survey experiment in November 2016, the week before Los Angeles County voters decided on a large transportation ballot called Measure M. Because we conducted the survey in the shadow of Measure M, transit issues were highly salient for many county residents.

Measure M was a proposal to permanently increase the county sales tax by one-half of one cent, and dedicate the revenue to transportation improvements throughout LA County. The measure would not finance public transportation exclusively—money was also earmarked for road repair and bicycle and pedestrian improvements—but 65 percent of the revenue was earmarked for transit, and particularly for a dramatic expansion of LA’s rail system. More important for our purposes, transit improvements dominated both the campaign rhetoric and media coverage of Measure M. The measure’s official title was the “LA County Traffic Improvement Plan” and proponents stressed public transportation’s role in fighting congestion (e.g., Nelson, 2016). On Election Day the measure passed overwhelmingly, with 71.5 percent approval.

Survey experiments, in which subjects are randomly assigned to a control group or one of several treatment groups within the context of a survey, are an increasingly common way to test the impact of different policy arguments on attitudes and behavior (Chong and Druckman, 2007). A survey experiment differs from a conventional cross-sectional survey by allowing researchers to explicitly separate causes and effects. A typical cross-sectional survey (for instance, a one-day travel diary or telephone poll) relies on naturally-occurring variance with no obvious causal direction. Thus associations detected in these surveys often have ambiguous interpretations: for example, do dense areas make people drive less, or do people who dislike driving move to dense areas? The implied treatment here (density) is not applied randomly across the population, so causality is hard to infer. A survey experiment, in contrast, lets the researcher explicitly manipulate treatments, and randomly expose some people to some conditions while leaving others as controls. In so doing inference becomes easier.

Survey experiments are not perfect (Gaines et al., 2007) but they can complement and improve on findings from more conventional approaches. Manville and Cummins, for example (2015), draw on representative public opinion surveys to determine the source of support for transit ballots. Their results suggest that people who support increased transit spending are motivated primarily by congestion and environmental concerns, as opposed to a desire to drive less or ride transit more. But the surveys they used were not designed specifically to elicit motivations behind transit preferences, and cross-sectional surveys generally have trouble

[9] Exposure to pollution is more common and severe among lower-income people (Currie et al., 2014), and few of our respondents are low-income (as we note later on).

[10] If riding transit in congestion is less stressful than driving in congestion, and that reduced stress compensates for slower travel time, then even switching to transit that lacks its own right of way might be more convenient.

Table 1
Summary of expectations.

Argument in favor of increased public transit spending	Effect on stated concern about issue	Effect on willingness to volunteer time
Congestion frame	Increase	Decrease
Norm, convenience, poverty, and climate frames	Increase	Increase

pinpointing specific motivations (Nisbett and Ross, 1980). These surveys also measured only one dimension of issue-engagement—attitudes—and did not measure people's willingness to participate in activism (Verba et al., 1995; Nie et al., 1996).

Our experiment randomly assigned subjects to read news stories about Measure M, which emphasized the different frames about public transit. We then measured both participants' attitudes toward transit and their willingness to engage in transit activism. To take our survey, we recruited a diverse sample of LA County residents (N = 1186) supplied by Survey Sampling International (SSI). SSI recruits survey-takers through various online communities, social networks, and website advertisements, and emphasizes harder-to-reach online groups like seniors (Berinsky et al., 2014). Once people agree to participate, SSI randomly invites them to take different surveys, with the random assignment constrained only by geographic restrictions and quotas set by the investigators. We restricted our sample to LA County adults, and set a quota to match the countywide population shares for gender and age.[11]

Because of their emphasis on hard-to-reach groups, SSI samples tend to be more diverse than other convenience samples. But they are convenience, as opposed to probability, samples, so our respondents are not representative of LA County adults or voters. The experimental nature of our approach, however, makes this less of a problem. Our survey is designed to measure how different arguments change attitudes within a randomized group, not to estimate the prevalence of different attitudes or arguments across the larger population. Our goal was not to ascertain why LA County voters supported Measure M. Instead, we used Measure M as a backdrop for, and window into, the issue engagement clout of different pro-transit arguments. As such, our sample will not and need not look like LA County overall, and our results may not and need not closely resemble the results of the actual election.

We randomly assigned our respondents one of six short written passages about Measure M. Each passage was designed to mimic a newspaper article, in both writing style and appearance, and subjects were told (truthfully) that most of the information was drawn from a recent article in the *Los Angeles Times*. One passage was a control, and simply described Measure M. Each of the other passages presented Measure M in one of our pro-transit frames: congestion, norms, convenience, poverty, and climate. While all passages acknowledge that the measure would not exclusively fund public transportation, they emphasized Measure M's transit focus.

As is the case in all experiments, our research design hinges on our ability to vary nothing across groups but the treatment itself. Thus in every passage the title was the same: "LA County voters decide on transit referendum this fall." Every group also saw an identical graphic that included a breakdown of the proposed spending for Measure M, and all of the non-frame text in each passage was the same (Fig. 1). We varied only two factors: the article's subtitle, which established the frame, and 1–2 bolded sentences at the end of the introduction, which elaborated on the frame. These variations were our treatments.

We tried to use the same amount of text for each treatment frame, and tried to make the treatments comparable in their level of detailed versus more abstract information. To that end, with four of the five treatment groups we included just one relatively-specific piece of information: the congestion frame talks about "90 hours wasted" in traffic, the norm frame cites data from "between 2004 and 2013", the poverty frame states that "a majority of transit riders in LA County are poor", and the climate frame refers to "20 percent of US greenhouse gases" coming from transportation sources.

We present the frame variations below. The control group read the following:

LA County voters decide on transit referendum this fall
In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the revenue being used to improve transportation, and particularly public transit, in the county.

The *congestion group*, in contrast, read this:

LA County voters decide on transit referendum this fall
LA congestion worst in the country; transit can reduce it
In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the revenue being used to improve transportation, and particularly public transit, in the county. Supporters of this measure argue that public transportation will reduce the awful road congestion you face every day. Every year, LA residents waste over 90 hours sitting in traffic—more than almost any other metro area in the country. You know what that's like. It's not only frustrating, unpleasant, and costly, but it also means that you don't have time for all of the other things that you enjoy. Better public transportation can help speed up driving on our roads, and give drivers back some of the time they currently spend in traffic.

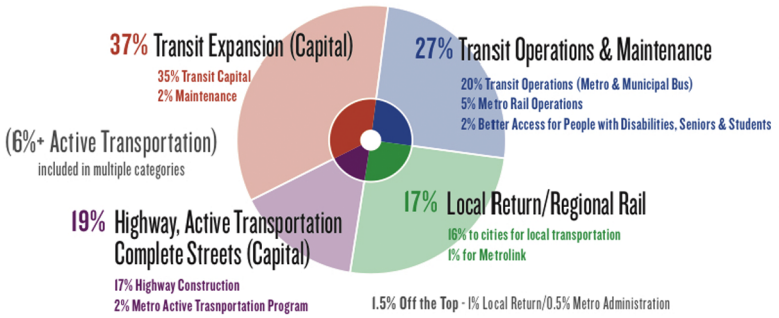
[11] Our actual sample ended up being slightly biased toward women (54 percent female, compared to LA County's actual share of 51 percent).

LA County voters decide on transit referendum this fall

In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the revenue being used to improve transportation, and particularly public transit, in the county.

Measure M promises to do a lot, both in the near future and also in future decades. In total, Metro would spend $120 billion to substantially upgrade the county's transportation system. The breakdown would be as shown in the figure.

Metro's new proposal would fund nearly two dozen mass transit lines and rail extensions and 14 highway projects, including widening the 5 Freeway in Santa Clarita and converting carpool lanes to toll lanes on the 105 and 405 freeways.


37% Transit Expansion (Capital)
35% Transit Capital
2% Maintenance
27% Transit Operations & Maintenance
20% Transit Operations (Metro & Municipal Bus)
5% Metro Rail Operations
2% Better Access for People with Disabilities, Seniors & Students
(6%+ Active Transportation)
included in multiple categories
17% Local Return/Regional Rail
16% to cities for local transportation
1% for Metrolink
19% Highway, Active Transportation Complete Streets (Capital)
17% Highway Construction
2% Metro Active Trasnportation Program
1.5% Off the Top - 1% Local Return/0.5% Metro Administration

The plan would boost the county's base sales tax rate to 9.5% by extending an existing half-cent sales tax for two more decades and raising the rate by an additional half-cent for at least four decades after that.

In return for the small tax hike, the proposal offers something for everyone throughout the county. As reported in the *Los Angeles Times* earlier this year, here are some of the highlights:

The measure would extend the Gold Line from Azusa to Claremont and provide funding to finish the Wilshire Boulevard subway by 2024, more than a decade earlier than scheduled.

The long-anticipated $8.5-billion rail tunnel through the Sepulveda Pass would also be partly funded, with an estimated completion date of 2033. Officials said the project could be finished sooner with private-sector funds and partly financed by the proposed tolled lanes on the 405.

"What we are proposing is a balanced connected transportation system, connected not just to highways and to transit, but to everything," Metro Chief Executive Phil Washington said.

Some other key aspects of the proposal include:

A 9.2-mile, $1.33-billion light-rail line along Van Nuys Boulevard. The route, slated to begin service between 2027 and 2029, would be the first rail line exclusive to the Valley and would provide a critical north-south connection in a network that largely runs east to west.

$286 million for speed improvements and new bridges across the Orange Line busway, and $362 million of the estimated $1.4 billion needed to convert the route to rail.

In addition, Measure M will include procedures for a 10-year comprehensive assessment as well as an independent board to ensure that projects get done when they are supposed to.

Fig. 1. Reproduction of Control Frame.

The *norm group* read this:

LA County voters decide on transit referendum this fall
Driving on the decline; voters want more transit
In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the revenue being used to improve transportation, and particularly public transit, in the county. Supporters of this measure argue that people in LA County, and the nation at large, want to drive less and use transit more. Americans drove less every year between 2004 and 2013, and vehicle ownership fell during that time as well. We should provide transportation infrastructure that helps people do what they want.

The *convenience group* read this:

LA County voters decide on transit referendum this fall
Driving increasingly a hassle for getting around; transit cheaper and more convenient
In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the

revenue being used to improve transportation, and particularly public transit, in the county. Supporters of this measure argue that in many cities, public transportation is a cheap and convenient way to get around, saving people like you the hassle of driving. Transit offers a good alternative to driving. Yet without funding for a more extensive transit system, you may not be able to get out of your car, avoid the hassles of the road, and enjoy quality public transportation.

The *poverty group* read this:

LA County voters decide on transit referendum this fall
Improved transit necessary for poorer LA County residents
In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the revenue being used to improve transportation, and particularly public transit, in the county. Supporters of this measure argue that public transit is an important social service in Los Angeles County. A majority of transit riders in LA County are poor, and many cannot afford cars of their own. Funding transit is a critical way to help disadvantaged people.

Lastly, the *climate group* read this:

LA County voters decide on transit referendum this fall
Improved transit necessary to clean our air, help climate
In November, voters in LA county will be asked to vote on a measure to raise the county sales tax by one half cent, with the revenue being used to improve transportation, and particularly public transit, in the county. Supporters of this measure note that motor vehicles contribute disproportionately to local air pollution and climate change. Cars and trucks create pollution that leads to asthma and other diseases, especially in children and the elderly. They also generate a full 20 percent of US greenhouse gases that lead to climate change. Public transit could help reduce driving and, as a result, our impact on the environment.

The remainder of the news story was the same for every group. After reading the passage, the respondents answered a series of questions about their attitudes toward Measure M, their willingness to become politically active on the issue, and their attitudes about transportation in general.

We asked three attitudinal questions. The first tapped into respondents' general view on Measure M: "Do you support or oppose the transit referendum?" Respondents could choose from five answers that ranged from "Strongly support" to "Strongly oppose." This question has advantages and disadvantages. One advantage is salience: by asking this question so close to Election Day, we reduce one common concern that can arise with survey experiments, which is that they ask people to think about abstract situations that have little real-world meaning to them. On the other hand, this same closeness to Election Day might mean people had already decided their positions on Measure M. Were that the case, responses to this question might capture pre-existing attitudes, rather than reactions to our frames. Random assignment controls for this possibility to some extent—so long as people with pre-existing opinions are spread evenly across the different frames, their opinions should not bias the results—but Measure M was very popular (winning 71.5 percent of the vote), so most people in most frames might support it, making differences hard to detect.

Our second and third attitudinal questions are more likely to avoid this potential problem (Baumgartner et al., 2009). These additional questions tap into opinions about transit and transportation, but do so without focusing specifically on Measure M. One asked subjects how public transit should be prioritized relative to other issues. This question read as follows:

While the piece you read earlier focuses on public transportation, arguably LA County faces many problems and we need to prioritize. This Election Day voters will be asked to make decisions about many problems facing the county. How would you prioritize the six issues listed below? Please rank them by dragging and dropping them to your preferred ranking.

Respondents were then asked to rank improving public transportation against funding for parks, funding to help the homeless, funding for affordable housing, improving streets and roads, and enacting rules to protect neighborhoods from increased development. Like transit, these five other issues were highly salient in November 2016. Improving streets and roads was a component of Measure M, and Los Angeles County was and is in a housing crisis that has focused attention on both affordable housing and homelessness. Indeed, on Election Day residents of the City of Los Angeles voted on both funding for homelessness and a measure to require more affordable housing from property developers. Controversy about property development, meanwhile, is an almost ceaseless part of LA's political landscape (Fulton, 1994; Manville and Osman, 2017), and on Election Day a number of the county's municipalities voted on anti-growth measures.

The final attitudinal question asked people how much they think they will drive in the near future. This question read: "Thinking about the near future, between now and New Year's, do you think you will drive less than you have recently, more than you have recently, or about the same?" This question is the most speculative of our attitudinal measures, and the hardest to interpret. We asked the question because many of Measure M's intended benefits hinge on at least some people choosing to use transit in lieu of driving. In that sense, if the pro-transit arguments are persuasive they might also give people a reason to rethink their current travel behavior, and report an expectation of driving less. Yet given the timing of our survey (it was administered shortly before the holidays) the bar for someone thinking they would drive less in the near future might be high. And of course a person momentarily feeling that they would like to drive less is not the same as someone *actually deciding* to drive less. For that matter, wanting to drive less is not the same as wanting to use transit more. Responses to this question, moreover, could also be interpreted in the context of de-motivation. A person who receives the congestion frame, for example, might think about how much time they spend driving, and then—regardless

of their desire to use transit—decide they would like to drive less. Given these ambiguities, we had no strong prior about how respondents might answer this question.

Our survey measured activism by asking respondents if they would be willing to volunteer time advocating for the issue. Given the timing of our study, the most sensible volunteer opportunity was outreach directly linked to the Measure M election. We asked respondents if they would be willing to volunteer a few hours before Election Day to increase awareness about the upcoming referendum. Here is the specific text:

> Move LA is an organization that advocates for more public transportation throughout Los Angeles County. Over the next few days, Move LA is leading efforts to educate voters about the transit referendum and ensure that supporters turn out on Election Day. Would you be interested in spending a few hours helping them out? As a volunteer, you'd go door-to-door educating LA County voters about the referendum. If you answer "yes" then you will receive more information about how to sign up at the end of this study.

This measure of activism is obviously limited, in that it captures only a stated willingness to volunteer. It does not tap into whether respondents would, for example, communicate directly with elected leaders about the issue (although, since Measure M was a referendum, it is unclear how effective communicating with elected leaders would be). Nor does it measure the willingness to engage in another common form of political activism, which is donating money (Berry, 1977).[12] Nevertheless, volunteering is a common way that people first get involved with causes they support (Karpf, 2012, Han, 2014).

Our activism measure is also limited by being embedded in a survey, rather than the field. We ask people if they would like to volunteer, but extract no commitment from them to actually do so. A skeptic might wonder how seriously respondents answered the question. At least some research, however, finds that survey questions like ours (which explicitly state what people would be doing as volunteers, as opposed to just asking people vaguely if they would be willing to volunteer) bring to mind considerations that mirror real-world decisions about taking action (Levine, 2015). Moreover, any limitations to our measure would apply equally across all experimental groups, and thus we do not expect it to affect the results when comparing treated groups to the control.

We rounded out the survey with a series of demographic questions. Together the responses to all these questions should allow us to estimate the effect of different frames on attitudes toward public transit, and the willingness to become politically active on behalf of public transit.

4. Results: public opinion and political action

Descriptively, our overall sample was 54% female, with an average age between 35 and 44, and an average household income between $40,000 and $45,000. Just under 48% of our respondents had at least a Bachelor's degree, and 40% were nonwhite. This makes our respondents whiter and better educated than the county as a whole, though also less affluent.

As mentioned above, however, the experimental nature of our study makes the sample's representativeness less of a concern. Given that only the frames varied across the sample, and all other information about Measure M was held constant across different groups, we can interpret our results—the average treatment effects—as the effect of each argument on support for public transit relative to the control group. That said, two issues arise. First is whether the sample is evenly apportioned across our six frames. A balance test (included in the Appendix) shows that on measures of gender, age, education, income, employment status, race, and type of home area (urban, suburban, or rural), our sample is balanced. On two other measures, however—political party identification and share non-white—the sample is unbalanced. Because race and party identification are at least somewhat collinear with a number of our other demographic and economic variables, in our models we include controls for all these attributes in addition to indicator variables for the five treatment groups (with the control group as the baseline to which we compare each of them).

The second issue is one of modeling approach. Our measure of activism was a yes/no question so we analyze it with a probit regression. Our attitudinal measures were recorded on 7-point scales. As is common in analyses of experimental survey data, we recode these as ranging from 0 to 1. Doing so gives us a dependent variable that is constrained at either end. We can analyze this variable in two ways. Because most of the observations were did not fall on the extremes, using a linear regression is probably defensible, although the risk of an out-of-sample prediction does remain (e.g. Long, 1997). The other approach is to use a generalized linear model with a logit link. For completeness we use both. We report the OLS results in the main text, and present the GLM results, which largely confirm our linear results, in the Appendix.

For ease of exposition, in the main paper we present our results in two ways. First, we present bar graphs that show the average responses in each experimental group, along with one measure of the spread within each group. Second, in the main text we note the magnitude of the average treatment effects comparing each of the treatment groups to the control, along with standard errors and the results of tests of statistical significance for these comparisons. These estimates and tests of statistical significance are the models mentioned in the previous paragraph, which appear in Table A2 in the Appendix.

We begin with our attitudinal measures, starting with support for Measure M. Fig. 2 presents the average strength of support in each of the six groups. Among our respondents the average strength of support was 67.2 percent (i.e. 0.672 on a scale from 0 to 1). To the extent that this measure could be interpreted as the share of the sample who would answer 'yes' to a yes-no question about whether they support Measure M or not, then it is close to what representative public opinion polls were showing prior to the election, and slightly below the actual share that voted yes (71.5 percent). Given that we sampled adults rather than voters, and had a

[12] Over three-quarters of the $10 million raised by the Yes on Measure M Campaign came from large institutional entities like developers, corporations, and labor unions.

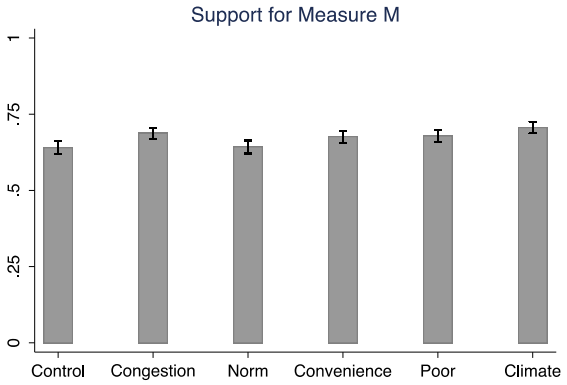


Fig. 2. Average support for Measure M, by treatment group (re-coded on 0-1 scale with higher proportions representing higher support). Bars represent plus/minus one standard error. Statistical comparisons in the main text are based on results in Table A2 in the Appendix.

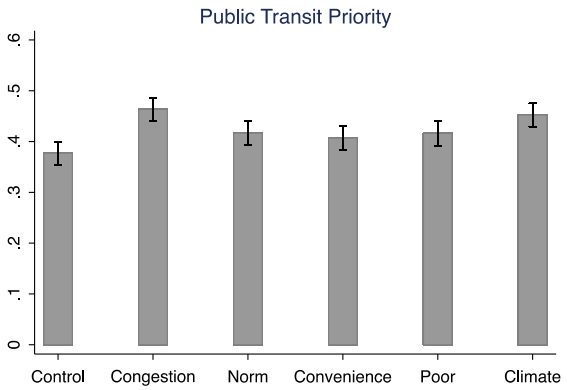


Fig. 3. Degree to which public transit should be prioritized, by treatment group (re-coded on 0–1 scale with higher proportions representing higher priority). Bars represent plus/minus one standard error. Note that the statistical comparisons in the main text are based on results in Table A2.

convenience rather than a probability sample, this discrepancy is unsurprising. Our regression results suggest that the climate frame made people more likely to support Measure M (diff = 0.05, t = 1.79, p = 0.07, in which "diff" refers to the marginal effect, controlling for other variables in the regression, of receiving the treatment rather than the control frame).[13] We saw no evidence, however, suggesting that the other frames increased support for Measure M (congestion: diff = 0.02, t = 0.93, p = 0.35; norm: diff = −0.02, t = -0.76, p = 0.45; convenience: diff = 0.02, t = 0.84, p = 0.40; poverty: diff = 0.03, t = 0.95, p = 0.34). Substantively, this means that the climate frame increased support from halfway between to "neither support nor oppose" and "weakly support" to be much closer to "weakly support". Our GLM results largely confirm this result, and suggest that seeing the climate frame is associated with an increase of about 0.05 (see Table A3).

The null finding on the other frames could arise for two reasons. First, these frames might simply be unpersuasive. We consider this unlikely, particularly for the congestion frame. A second potential explanation is that, as mentioned above, we fielded our experiment immediately prior to the election, so many respondents may have already formed opinions about it. Measure M was extremely popular—some of the earliest polls taken about it, before it was even formally proposed, showed 70 percent approval—so the bar for a particular frame making it more popular may have been high. For this reason, we use our secondary measures of public opinion to further probe the effect of our frames.

Fig. 3 turns to the question of how our frames change transit's rank as a policy priority—the degree to which people believe public transportation should be prioritized above five other prominent local issues. Our subjects ranked all six issues, so we are interested in the average rank of "expanding public transportation." As context, note that transit is never the highest priority on average, but also never the lowest.

Fig. 3 shows, for each treatment group, the average rank assigned to transit. We find strong support for the idea that a congestion frame increases attitudinal support for transit: respondents who saw Measure M described as a way to reduce congestion placed a higher priority on transit (diff = 0.07, t = 2.16, p = 0.03). As was the case in Fig. 2, the climate frame was also persuasive in this regard (diff = 0.06, t = 1.90, p = 0.06).[14] Substantively, both these frames moved public transportation's average rank up by more

[13] All tests of statistical significance are two-tailed.

[14] That said, as shown in Table A2 in the appendix, overall goodness-of-fit the models examining transit priority and attitudes toward driving less is quite low.

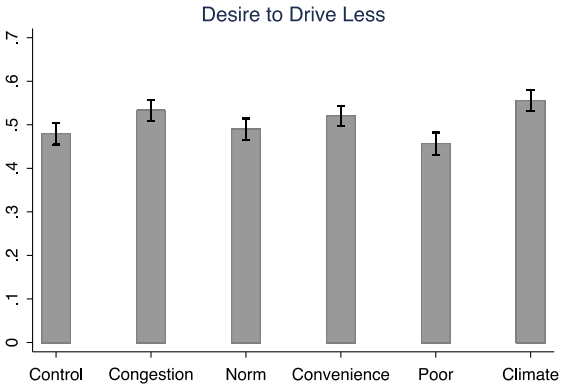


Fig. 4. Desire to drive less in the near future, by treatment group (re-coded on 0–1 scale with higher proportions representing greater desire to drive less). Bars represent plus/minus one standard error. Note that the statistical comparisons in the main text are based on results in Table A2.

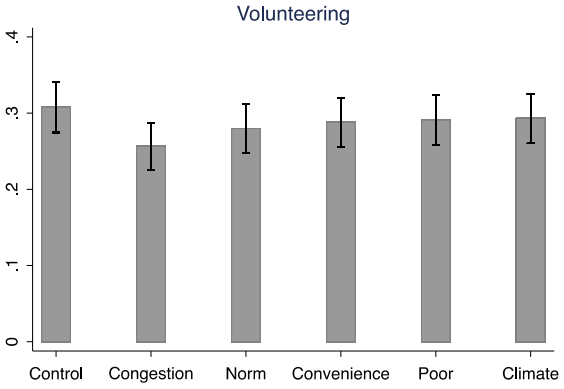


Fig. 5. Proportion signing-up to volunteer, by treatment group. Bars represent plus/minus one standard error. Note that the statistical comparisons in the main text are based on results in Table A2.

than an entire notch: from just below fourth out of six (in the control group) to well above fourth out of six. We found no evidence that the other three frames moved opinions relative to the control group (norm: diff = 0.04, t = 1.10, p = 0.27; convenience: diff = 0.03, t = 0.86, p = 0.39; poverty: 0.04, t = 1.04, p = 0.30).

The GLM again confirms these OLS results. For people who saw the congestion frame, the predicted mean of the transit priority variable, controlling for other variables, is 0.47. For people who did not see that frame, it is 0.41. The numbers and magnitudes are similar for the climate frame.

Fig. 4 shows the impact of our frames on people's desire to drive less in the near future. Here again we see the strongest evidence of persuasion among the congestion and climate frames (congestion: diff = 0.06, t = 1.71, p = 0.09; climate: diff = 0.08, t = 2.41, p = 0.02). Substantively, both of these frames shifted opinions from just below the midpoint on the scale in the control group (i.e. the point at which people say they plan to drive the same amount in the near future) to a few percentage points above the mean, making people slightly more likely to say they will drive less. And again we see no evidence that our other three frames were persuasive (norm: diff = 0.02, t = 0.50, p = 0.62; convenience: diff = 0.04, t = 1.25, p = 0.21; poverty: −0.01, t = −0.40, p = 0.69). The GLM results in Table A3 again reinforce these results: the congestion frame is associated with an increase of 0.06 along the 0–1 scale, and the climate frame with a 0.08 increase.

We next turn to our results on political activism. Fig. 5 shows the proportion of respondents agreeing to volunteer in each of the six groups. As expected, the congestion frame appears to reduce activism. We estimate that a congestion-based argument reduced activism by eight percentage points (z = −1.88, p = 0.06). This pattern is consistent with our hypothesis that people are less willing to spend time volunteering when political rhetoric reminds them about constraints on their time.[15] In our sample there were 200 people randomly assigned to the congestion group, and so this decrease would lead to 16 fewer volunteers.

We also see suggestive, though weak, evidence that the norm frame reduces activism, though the estimate falls just short of

[15] One might argue that we should examine the impact of the congestion frame only among those who own a car. We disagree. Many people who ride transit are likely to be on buses, so they will waste time on congested roads. Nevertheless, we verified that the congestion frame reduced activism among those who owned a car. 87.3% of our sample reported that they own a car, and among those there was a 5.7 percentage point decline in activism among those exposed to the congestion frame as compared with the control group (z = −1.74, p = 0.08).

conventional levels of statistical significance (diff = −0.07, z = −1.62, p = 0.11). Lastly, we see no evidence that any of the other frames affected behavior (convenience: diff = −0.02, z = −0.50, p = 0.62; poverty: diff = −0.01, z = −0.22, p = 0.83; climate: diff = −0.03, z = −0.75, p = 0.45).

To summarize thus far, the congestion frame appears to be both persuasive and paralyzing. Exposure to this frame made people more likely to rate transit a higher policy priority and to indicate that they wanted to drive less in the near future. Yet it also *reduced* their desire to volunteer with Move LA. One explanation for this paradox, as we have already suggested, is that the congestion frame reminded people of the time they waste in traffic, which in turn made them less likely to commit scarce time (even within a survey) to volunteering.

We also find evidence that the climate frame was persuasive, as it affected support for Measure M, transit's rank as a policy priority, and the desire to drive less. These results are consistent with this frame tapping into a strongly-held value (environmentalism) that is particularly prevalent in liberal Los Angeles County. Unlike the congestion frame, however, the climate frame does not show evidence for the strongest type of divergence between attitudes and activism: the frame did not increase people's willingness to volunteer, but did not reduce it either.

We observed suggestive evidence that the norm frame may have reduced willingness to volunteer, though it had no impact on attitudes. Respondents may have considered this frame especially weak. Buttressing this explanation, when we examine responses to a question at the very end of our survey that asked people to rate the strength of the five arguments in each of our treatment groups, ratings for the norm frame were significantly lower than all of the others.[16]

Finally, the last two frames–poverty and convenience–affected neither activism nor attitudes. This null result is striking in its own way, since—as noted in the introduction—those two arguments for public transportation are arguably the most realistic. Transit nationwide, and especially in LA County, functions as a social service for the poor. Over 60 percent of LA Metro bus riders, and almost 40 percent of rail riders, are poor. Similarly, while virtually no evidence suggests that public transportation can affirmatively reduce road congestion and let automobiles travel faster, transit systems can (depending on their design) help people avoid congestion if they choose not to drive. We thus find some evidence that the most realistic arguments for transit are also among the least convincing.

5. Discussion and conclusion

Public transportation in the United States is many things to many people: an alternative to driving, a way to make driving easier, a social service for the poor, and a salve for environmental ills. Some of these roles constitute transit's everyday work, while others are more aspirational. Each has been deployed, in different instances, as an argument for more transit investment.

We have investigated the relative power of these different arguments for transit. Our results speak to both transportation politics in particular, and to discussions about political mobilization more generally. Within the realm of transportation politics, our findings reinforce the challenges of mobilizing voters in automobile-oriented areas to support public transit. Most people in most areas are not regular transit riders. Many voters, in fact, may not even know a regular transit rider. Making transit relevant for these people requires linking it to a material interest they *do* have (like traffic congestion) or using it to activate a more abstract political identity (such as being an environmentalist).

Transit advocates have made these links admirably, as evidenced in the impressive win percentage of transportation ballots. But our results raise two concerns. The first concern is not new, though we provide new evidence about it: the most appealing conceptions may also be less accurate. The second concern is, to our knowledge, heretofore unmentioned in the literature: in emphasizing road congestion as a reason to support transit, advocates may be reducing activism on transit's behalf.

How important are these concerns? With respect to the first concern, if the goal is simply to win elections, then the strongest message is the best message, and accuracy is secondary. From a broader perspective, however, there may be costs to emphasizing transit's least realistic goals, and downplaying its important everyday business as a social service. To the extent people mistakenly believe transit can and should reduce congestion, they may be less interested in transit's redistributive role *and* less interested in policies, like congestion charging, that could realistically reduce traffic problems.

With respect to the demotivation concern: suppressed activism will not necessarily influence the result of transit *elections*. As Luberoff (2016) and others have shown, transit ballot campaigns are exercises in coalition politics, and they rely on alliances of local political elites, like business, labor, and landed interests. These elites, and especially unions, can mobilize volunteers and conduct outreach, and can boost turnout by strategically timing their measures to share ballots with presidential races. But suppressed activism might still have a cost. In the aftermath of the election, the transit coalition often dissolves, even though fights over transit implementation may be just beginning. Our results thus suggest if some common frames suppress activism–-most notably the congestion frame—the price of that suppressed activism may be higher *after* the general election, when the electoral coalition is gone, the broader political context has changed, but substantial decisions about transit implementation are nevertheless being made. It is

[16] This question read: "Regardless of your own view on the transit referendum, please tell us if you think the following reasons for supporting it are strong or weak." Subjects were then presented, in random order, with the five arguments that appeared in our treatment groups and asked to rate each one on a five-point scale from "very strong" to "very weak". This question appeared after all of the other questions. We coded responses on a 0–1 scale, with higher numbers indicating greater strength. The average response in the norm group was 0.60 (i.e. closest to "neither strong nor weak") whereas the average response to all of the other arguments was 0.81 (congestion frame), 0.74 (convenience frame), 0.72 (poverty frame), and 0.77 (climate frame). All of these other four frames were rated as close to, if not above, "strong" on the scale. It is worth noting that, as expected, the two frames with the largest effects on attitudes (congestion and climate) also reported the highest average strength.

possible, of course, that other activists, motivated by concerns other than congestion, can step in at this time. But remember that many of the other pro-transit arguments were less persuasive than congestion—only climate rivaled it—so there are a limited number of sources for these other activists to come from.

Having said all that, an obvious caveat to our research is that we report the results of a single experiment. Our results are consistent with broader theoretical claims in the political science literature about the role of personal relevance, and about the potential for de-motivation (Chong et al., 2001, Levine, 2015). Furthermore, given the closeness of our survey to the election, and the relative weakness of our intervention, we consider our test a conservative one, and it may well understate people's actual reactions to different pro-transit arguments. Nevertheless, our work could be replicated and extended in different ways and contexts, and probably should be before any sweeping policy pronouncements are made. Additional experiments could explore the effect of social motivation, and parse the impact of messaging and messengers, by having the congestion frame delivered by a friend who asks for help with volunteering. Further, our treatments only involved text embedded in a stimulus designed to look like a newspaper article. Additional experiments could examine the impact of visual stimuli, perhaps by adding images of traffic, or pictures of smog, or perhaps pictures of a particular low-income transit rider.

Finally, our work could be extended with a focus on other types of activism, such as donating money. If our argument is correct, arguments that emphasize the time costs of congestion would not suppress the willingness to donate money, although arguments that cited congestion's monetary costs might (c.f. Levine, 2015).

In short, much more can and should be done; we see this article as only a first foray. To the extent our present results have some validity, however, they suggest that appeals to self-interest can be double-edged. The obvious alternative is to tap into values, but our results highlight the difficulty of doing so. Our two frames that tap most clearly into values (norms and poverty) produced no evidence of persuasion. Material self-interest, for better or worse, is a powerful policy frame, in transportation as well as other policy domains, but those who try to harness it should be aware of its less visible drawbacks.

Acknowledgement

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Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tra.2018.10.001.

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